Patterns of occupational stress in police contact and dispatch personnel: Implications for physical and psychological health

Niall Galbraith, David Boyda, Danielle McFeeters, Victoria Galbraith

Abstract

Purpose

Occupational stress in police call handlers is researched less frequently than in operational or front-line police, despite the role's unique challenges. Occupational stress is potentially manageable, thus improved understanding of its contributors and consequences is important for effective intervention. We aimed to compare levels and sources of organisational stress in police contact and dispatch personnel with UK benchmarks. Secondly, to test whether different typologies of stress were associated with physical health, mental health and substance use. Finally, to examine whether non-organisational factors (socio-demographic factors and family interference with work (FIW)) predicted organisational stress typologies.

Methods

A sample (n = 720) of police and civilian staff in a UK police call and dispatch centre were surveyed.

Results

The strongest sources of stress were competing and high demands, low control, insufficient managerial support and ambiguity surrounding workplace change – all of which indicated need for 'urgent action' according to UK benchmarks. Substance use and particularly mental health difficulties were higher than published norms. A latent profile analysis grouped respondents into a low stress group and two high stress profiles: As stress increased across profiles, this corresponded with worse physical and mental health and higher substance use. FIW predicted membership of both high stress profiles.

Conclusion

Despite non-operational roles, police contact and despatch personnel can experience high occupational stress which is associated with physical and mental health difficulties and substance use. Organisational-level interventions which address lack of control, conflicting role demands as well as enhance management support and communication around change might be most effective in this group.

Key words

Police contact, dispatch, stress, mental health, physical symptoms, organisational

Introduction

It is generally accepted that police staff experience elevated levels of stress (Violanti et al. 2017; Houdmont et al. 2012) which is substantiated by both biological and self report markers (Kales et al. 2009; Planche et al. 2019; Walvekar et al. 2015). Inherent in these roles are a variety of sources of work related stress ranging from occupational hazards (e.g. vocational exposure to trauma, violence and provocation, erratic shift work), work-family/family-work conflict to organisational management factors (Collins and Gibbs 2003; Kula 2017; McCanlies et al. 2019). Characteristics such as shift work and sleep disturbance (Ma et al. 2015; Fekedulegn et al. 2013; Gerber et al. 2010), critical incident exposure or personal threat (Chopko et al. 2015; Maguen et al. 2009; Yuan et al. 2011) and police sub-culture (Rose and Unnithan 2015) have been linked to the presence of work related stress in this population.

Studies show that work stress can negatively affect officers' physical and mental health (Kales et al. 2009; Magnavita et al. 2018; Violanti et al. 2017), disrupt family relationships and increase the propensity to use negative coping strategies such as substance use (Chopko et al. 2013; Gershon et al. 2009). The magnitude and sources of stress will invariably differ by job role, experience and a variety of other factors (Patterson 1992; Perrott and Taylor 1995). For instance, stress tends to be higher among police staff than other similar occupations such as correctional officers (Trounson et al. 2016), digital forensic examiners (Holt and Blevins 2011) and many other helping professions (Adams et al. 2017; Kales et al. 2009). Similarly, stress markers are accentuated more amongst tactical than frontline officers, who in turn exhibit higher stress levels than general population samples (Planche et al. 2019). Moroever, criminal officers perceive more stress comparative to emergency officers (Habersaat et al. 2015). Early research has also demonstrated that whilst police officers and prison guards do not differ significantly in scale either of "general" or "occupation-specific" stress, they do diverge in relation to the significant dimensions of occupation-specific stress (Anson et al. 1997). In one police specific study (Violanti and Aron 1995) organisational factors were cited as the most

pertinent stressors for desk sergeants whereas stress surrounding the risk of killing someone in the line of duty was prominent for other police staff.

Some sources of stress are relatively distinct to operational policing particularly exposure to violence and critical incidents (Chapin et al. 2008; Chopko et al. 2015; Maguen et al. 2009; Yuan et al. 2011). Vocational obligation to respond to violent incidents has been highlighted as one of the most highly rated and frequent stressors amongst police (Violanti et al. 2016). Nonetheless, stress from critical incidents can also be found in police dispatch workers despite their physical separation from these events (Chapin et al. 2008). However, in the transactional model of occupational stress (see Cox and Griffiths 2010), it is organisational factors (e.g., lack of support, work hours, administrative demands etc.), which are posited to be the primary antecedents of stress. Indeed, organisational factors are associated with stress in both operational police officers (Shane 2010) and in non-operational police (Acquadro Maran et al. 2015). Furthermore, organisational stressors have also been found to play a greater role in police stress than operational factors and are considered more effective targets of stress and mental health interventions (see Dollard et al. 2019; Montano et al. 2019; Shane 2010; Tuckey et al. 2012).

The effects of stress in operational officers (e.g. Chapin et al. 2008) have received far more attention than stress in non-operational or civilian police staff such as call handlers and dispatchers. This may be due to the assumption that call handlers and dispatchers are likely to have minimal exposure to stressful events and as such, are less likely to suffer the effects of occupational stress. However, non-operational call and dispatch staff encounter unique occupational challenges that are symptomatic of environments which cultivate organisational work stress (Regehr and LeBlanc 2017; Steinkopf et al. 2018). These can include a lack of organisational control, the effects of shift-work and poor relationships with colleagues. Emergency dispatch workers also report similar levels of psychological distress to that of their

operational police counterparts (Steinkopf et al. 2018). Additionally, the dispatch role creates significant cognitive demands in the handling of complex information and the coordination of that information between the public and police responders (Artman and Waern 1999). Police dispatchers must also manage the emotionality of emergency incidents; usually being the first point of contact for distressed members of the public whilst simultaneously maintaining emotional neutrality (emotional labour: regulating emotional display in line with organisational norms, Brotheridge and Lee, 2003). Research shows that emotional suppression in emergency call handlers and dispatchers is associated with psychological, physical and relational difficulties (Shuler 2001). Unlike officers working in the field, call handlers and dispatchers also have less control over the emergencies they are tasked with. This is significant considering that lack of decisional latitude has been shown to be a significant source of stress within the police (Morash et al 2006). Furthermore, non-operational personnel have a more sedentary worklife which affords fewer opportunities for relieving stress through exercise.

Despite this, research on emergency call handlers and dispatchers is scant and there have been even fewer studies specifically examining the effects of stress in police call handlers and dispatch personnel. Modern policing budgets generate increasing demands on governments. Stress can negatively affect personnel turnover, absence and performance, all of which deplete budgets further (Shane 2010). Police budget holders now regard police stress as a foreseeable and potentially manageable component of police work, and therefore, informing police managers and budget holders about the sources and mitigators of stress may be a more cost effective strategy than recruiting and training replacement personnel. For this reason, it is practical to understand the degree, sources and effects of stress in this under-researched group, so that workplace interventions can be targeted more effectively.

The aim was to use the UK Government's Management Standards Indicator Tool to contrast the levels and sources of organisational stress in a UK sample of police contact and dispatch personnel with comparative UK general population benchmarks. Secondly, to employ an exploratory Latent Profile Analysis (LPA) to test whether different typologies of organisational stress are associated with physical health, mental health difficulties and substance use. Finally, to examine whether non-organisational factors (socio-demographic factors and family-work conflict) predict typologies of organisational stress.

Method

Recruitment and data collection procedure

A voluntary sample (n = 720) of participants was recruited from the police contact department consisting of approximately 1100 police and civilian staff within a large UK police force, serving both rural and urban populations. The department is the initial point of contact with the public and is staffed by both officers and civilians, with considerable overlap between the roles of serving officers and civilian staff. The selected department comprised both a central contact hub and local contact centres which handled telephone contact, front desk walk-in and resource allocation dispatch (RAD). Prior to the study distribution, the authors sought support from management, human resources and from union representatives to assist with advertisement and recruitment and consultation over methodology and ethics.

An anonymous survey was hosted online using Survey Monkey with a private and password-protected university account for a period of two months. The contact and dispatch department distributed the study invitations (containing the web-link to the study materials) to employees of the police contact department via internal email and the force's intranet. The measures took between 10 and 20 minutes to complete. In order to boost responses, two follow-up reminders were sent over a period of two months boosting response rates from an initial 32% to 65%. All

respondents gave their consent before participation. The study was approved by the authors' university ethics committee and was performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

Measures

Data was collected using a number of questionnaires, Cronbach's alpha values from our data are reported below. Firstly, the Health and Safety Executive's (HSE; UK regulatory body responsible for workpace health and safety) (Edwards et al. 2008) Management Standards Indicator Tool which uses 35 items to measure work-related stress in seven areas: demands (α = .81), control (α = .83), management support (α = .87), peer support (α = .82), relationships (α = .76), role (α = .83) and change (α = .75). Lower scores represent higher stress with responses given on a five-point scale (never, seldom, sometimes, often, always). Scores on demands and relationships are negatively phrased but to facilitate comparison with the other HSE indicators, these two factors have been reversed scored so that lower scores reflect higher stress, as with the other factors. The HSE tool has excellent psychometric properties and extensive benchmark data derived from a sample of 30,903 employees from across 39 UK organisations (Edwards et al. 2008).

The Physical Symptoms Inventory (PSI-12) (Spector and Jex 1998) is a 12-item unitary measure of physical symptoms (e.g. constipation, dizziness) occurring in the past month and measured on a five-point scale ranging from 0-4 (not at all, once or twice, once or twice per week, most days, every day). Higher scores (ranging from 0 - 48) indicate a greater number and frequency of physical symptoms (α = .84).

The General Health Questionnaire – 12 (GHQ-12; Hankins 2008), is a reliable and valid 12-item measure of mental health. The psychometric scoring system was used, with each item scored on a 0-3 scale (total scores ranging from 0 - 36): (not at all, same as usual, rather more than usual, much more than usual). Higher total scores indicate poorer mental health (α = .87). For the purpose of the current study, sample means were compared to published norm data taken from a general population sample (see Hankins 2008).

The Brief COPE Inventory, substance use subscale (Carver 1997) measures use of alcohol or drugs as a coping mechanism on a four point response scale (I usually don't do this at all, a little bit, a medium amount, a lot) with total scores ranging from 2 to 8. Higher scores indicate greater substance use (α = .92). The sample means of the current study were compared to data taken from a sample of project managers reported by Aitken and Crawford (2007).

The strain-based Family Interference with Work (FIW) subscale of the Work-Family Conflict Scale (Carlson et al. 2000) was used to assess the degree to which stresses and strains from performing the family role interfere with work, where higher scores reflect greater interference. Respondents rated agreement on a five-point Likert scale (strongly disagree, disagree, neutral, agree, strongly agree) with scores ranging from 3 to 15 (α = .93). In relation to this measure, sample means were compared with norms from a sample of employed adults (Frone 2000).

Respondents were also asked about their age, sex and ethnicity. Any question could be omitted if desired and all responses were anonymous as no personally identifying details were requested.

Analytic strategy

For benchmarking purposes, a mean score on each of the seven HSE categories was calculated and compared against normative averages in each domain. Colour codes were then assigned denoting the percentile within which the scores fall in relation to the benchmark data. From this several recommendations are generated:

Green = doing very well – need to maintain performance ($\gtrapprox P_{80}$);

Blue = good, but need for improvement ($> P_{50}$);

Yellow = clear need for improvement ($< P_{50}$);

Red = urgent action needed ($< P_{20}$).

Following this, a manual 3-step latent class analysis (LCA; Asparouhov and Muthén 2014) was conducted using aggregate scores on the seven HSE domains. This technique aims to identify homogenous groupings of individuals who endorsed similar patterns of stress. The estimation procedure also examined each of the subgroups in relation to a range of predictors (age, gender, ethnicity and FIW) and distal outcomes (PSI-12, GHQ-12, substance use). A series of 1-6 class models were estimated and several fit indices were used to determine the optimal model fit. In addition to parsimony consideration, the Akaike Information Criterion (AIC: Akaike 1987), the Bayesian Information Criterion (BIC: Schwarz 1978) and the sample size adjusted BIC (SSABIC: Sclove 1987), were used to ascertain model fit. Better fitting models are indicated by lower values of the AIC, BIC and the SSABIC. The Lo-Mendell-Rubin adjusted likelihood ratio test (LRT: Lo et al. 2001) and the Bootstrapped Likelihood Ratio Test (BLRT; Arminger et al. 1999; McLachlan and Peel 2004), were applied to evaluate models. The p-value generated for the LMRT and BLRT indicates whether the solution with more classes ($p < .05$) or fewer classes ($p > .05$) fits better. Predictors of class membership were assessed using the auxiliary command (R3STEP) and included a range of socio-demographic variables (**Table 3**). Distal outcomes were assessed using the BCH Method in Mplus to Estimate a Distal Outcome Model

which examines the relationship between the latent predictor (i.e., the classes of stress) and the manifest outcomes, i.e., physical symptoms (PSI-12), mental health (GHQ-12) and substance use (Brief -COPE) (**Table 4**) (Asparouhov and Muthén 2014; Lanza et al. 2013). All analyses were conducted using Mplus version 8.3 (Muthén and Muthén 2017) robust maximum likelihood (Yuan and Bentler 2000).

Results

Descriptives and normative comparisons

The sample (n=720) comprised more females (316, 43%) than males (209, 29%) (195 gender not indicated, 27%), with a mean age of 43 years (SD =8.9), Sixty-five percent were in full-time employment (65%; 24% missing). Sixty-seven percent of the sample identified as white, 5% recorded non-white or mixed ethnicity (28% missing). **Table 1** shows all variables of interest alongside normative comparisons.

From the HSE indicator tool, mean scores on demands, control, managerial support and change were all below the 20th percentile and are thus red flagged. The other three HSE domains fell between the 20th and 50th percentile and were yellow flagged. On substance use and particularly the GHQ-12, scores were higher than published norm data. On FIW, the mean was comparable to the published norm.

Table 1 about here

Latent Profile Analysis

Table 2 shows the fit statistics for the latent profile analysis. The fit indices indicated the 3-class solution was a better fit for the data than the 1 and 2-class models due to smaller AIC,

BIC and higher entropy value. The insignificant LRMT (P>0.05) in the 4-class solution indicated the previous 3-class was the most parsimonious solution. Models 4-6 were rejected based on small class sizes that were considered too small to be of substantive value (<20), insignificant LMRTs and lower Entropy values. Within the 3-class solution, the average probability of belonging to that class was 0.89-0.93 indicating good classification accuracy (values of 1.00 indicate certainty with respect to classification). The 3-class solution is illustrated in **Fig 1.**

Table 2 about here

Interpretation of classes are as follows: class 1 comprised 55% of the sample (n=300) and was termed the 'low stress' class as individuals in this class endorsed the highest scores across all organisational stress domains. In converting the output to benchmark colour coding, this translates to 'Green - doing very well' across all indicators with the exception of control which was coded as 'Red - urgent action needed' within this class. Class 2 (termed 'high stress') comprised 41% of the sample (n = 227) and represents individuals with high levels of occupational stress since that they met the threshold for 'Red – Urgent action required' across all indicators. Similarly, Class 3 which comprised 4% of the sample (n = 22) met the threshold for 'Red – Urgent action required' across all indicators and was termed 'Very high stress' class since this class comprised individuals who endorsed the lowest scores across all organisational stress domains. The observed results of non-organisational predictors of class membership indicated that only FIW was significantly and positively associated with both the high ($ß$=0.08, P<0.05) and very high stress classes ($ß$=0.22, P<0.05). Results are shown in **Table 3.**

Table 3 about here

Results for each of the distal outcomes are reported in **Table 4.** Following Bonferroni corrections, results showed significant between-class differences in physical symptoms $\chi 2(df=2) = 63.10$, $P < 0.001$, substance use $\chi 2(df=2) = 10.33$, $P < 0.05$, and mental health $\chi 2(df=2) = 112.51$, $P < 0.001$. Specific contrasts indicated that scores were higher for Class 3 (Very high occupational stress class) across all distal outcomes, compared to other classes. Class 2 scores were also higher than those of Class 1 on physical symptoms and mental health but not on substance use.

Table 4 about here

In terms of incomplete data, missingness was noted as follows: age was n=46%, sex was n=27%, and ethnicity was n=28%. Missingness was also assessed on the latent profile analysis (LPA) indicators and showed more than 82% data present. Missing values were estimated (-99). Mplus makes use of cases with incomplete data and missing data is estimated based on the values of the covariates in the model using full information maximum likelihood (Schafer & Graham, 2002).

Discussion

Organisational stress within the police service has been studied extensively (Violanti et al. 2017), yet police contact and dispatch personnel remain an overlooked sub-group of this population, despite the unique challenges to their role (Steinkopf et al. 2018; Regehr and LeBlanc 2017). With this in mind, the current study was designed to gauge the level of work stress among this occupational group relative to general population benchmarks, to establish whether differing typologies of work stress in this population have divergent implications for physical and psychological health and for substance use and to examine whether non-organisational factors predict typologies of organisational stress.

In regards to the first aim, the sample showed high levels of stress in all domains relative to published benchmarks (Edwards et al. 2008); scores on work demands, control, managerial support and change were all indicative of 'urgent action needed' according to the HSE tool criteria. Stress resulting from an absence of peer support, conflict within working relationships and job role conflict was marginally better, yet still met the threshold for a recommendation of a 'clear need for improvement'. These findings add to previous research by showing that like their operational colleagues, police contact and dispatch personnel experience significant levels of stress due to organisational factors which exceed those found in the general population (Morash et al. 2006). Previous research (Houdmont et al. 2012) has used the HSE indicator tool with UK police and also found that levels of stress were worse than UK benchmarks. However, within that study stress was measured across an entire regional police force whereas the current study has focused exclusively on police contact and dispatch personnel due to the relative neglect of this group in the literature. Whilst this is not the first study to highlight the challenges associated with emergency call and dispatch personnel (Regehr and LeBlanc 2017; Steinkopf et al. 2018), it is the first to assess specific sources of *organisational-level* stress in *police* contact and dispatch workers using an industry standard tool which can be compared

with published benchmarks. Although work demands, control, managerial support and change were found to be particularly strong sources of stress, control was the only indicator consistently found to be in need of urgent action across all stress profiles (i.e. low, high and very high stress groups). This finding is likely to reflect aspects of the job which are unique to call handling and dispatch: specifically, exercising restraint and emotional neutrality in the face of public distress, rapidly processing complex information and communication between the public and responders, and in particular, a lack of control perhaps by virtue of the physical separation from events or perhaps because the role affords less autonomy in deciding what, when and where work is done (Artman and Waern 1999; Morash et al. 2006; Shuler 2001; Steinkopf et al. 2018). Although contact and dispatch work is less physically demanding than many other frontline policing roles, our findings correspond with previous research which has highlighted that emergency dispatch work involves significant psychological strain (Regehr and LeBlanc 2017; Shuler 2001; Steinkopf et al. 2018). Although Atkinson (2017) argues that police roles are often gendered, as Shane (2020) notes, high levels of stress in police are usually attributable to the same kinds of organisational factors found in our sample than to the tradiationally masculinised operational stressors epitomised by the 'crime-fighting' police role.

In response to the second aim, the sample reported higher levels of substance use and particularly mental health difficulties than benchmark figures (Carver 1997; Hankins 2008). A latent profile analysis also established that the most appropriate way to group the personnel based on the occupational stress indicators was into three groups: very high, high and low stress which were reflective of the stepwise increase in work stress scores across profiles. Greater work stress coincided with poorer psychological health, more physical symptoms and higher substance use. As expected, these findings echo decades worth of research illustrating the negative association between stress and well-being (Hausser et al. 2010; Van der Doef and

Maes 1999) but for the first time illustrate these relationships among police contact and dispatch personnel specifically.

Family interference with work (FIW) was found to be predictive of both very high and high occupational stress profiles, consistent with previous studies in police staff (e.g McCanlies 2019). This may suggest that difficulties at home can erode the ability to effectively navigate stressors within the work setting or, that the cumulative effect of FIW combined with work stressors may aggravate responses to workplace stress. Indeed, FIW has been found to be an important pre-cursor to stress, culminating in further work-family conflict which ultimately compounds work stress (Kelloway, Gottlieb and Barham 1999). Research shows women experience more FIW than men (Allen and Finkelstein 2014). It is possible therefore, that the relatively high numbers of women in our sample (compared to the UK police service overall), influenced the relationship between FIW and stress. This is perhaps consistent with arguments on how the ideal career model of policing is gendered: e.g. very long hours, full-time, non-flexible, years of uninterrupted service – ways of working less available to women (Silvestri 2007, 2017).

These findings show that as with pre-existing studies of the police and the general population (Chopko et al. 2013; Gershon et al. 2009; Kerr et al. 2009), occupational stress in call handlers and dispatchers is associated with a series of negative physical, psychological and behavioural outcomes. If managers wish to mitigate stress in police contact and dispatch personnel and minimise its effects on performance, staff costs and wellbeing, there is urgent need for further research into the causes and most effective mitigators of stress specific to this population. Perceptions of what constitutes effective police leadership have shifted away from an authoritarian view towards a more supportive and transformative style (Campbell and Kodz

2011; Pearson-Goff and Herrington 2014). Managerial support must account for the possibility that call and dispatch departments might have different expectations for leadership than operational police do (see Lumsden and Black 2018). However, evidence suggests that uniformed police *and* civilian staff value supportive management equally and that both groups' perceptions of their management affect their levels of commitment to the job (Dick and Metcalfe 2001). A further barrier/facilitator to organisational-level intervention is leadership endorsement of effective stress management (Brown et al. 1996), perhaps more dependent on a transformational (rather than transactional) leadership style (Silvestri 2007).

Existing research (e.g. Dollard et al. 2019; Montano et al. 2014) shows that organisational-level stress interventions are more effective than those at the individual-level (e.g. clinical interventions or coping training). The effectiveness of organisational-level interventions has been demonstrated in the police (Dollard et al. 2019; Rasadi et al. 2018) and emergency services (Petrie et al. 2018), however they are more difficult to deliver and thus less likely to be implemented (Tuckey et al. 2012). The HSE indicator tool is regarded as the industry standard for benchmarking sources of organisational stress in the UK and is a reliable guide for organisations and sectors as to which domains organisational stress management interventions should be directed. Our data suggests that organisational-level interventions which improve control, reduce work demands and promote more supportive management should be priorities for police contact and dispatch departments. Since improvements in control are not easily facilitated due to the nature of the role, enhancements of managerial support may be a more readily achievable target which may indirectly serve to buffer the impact of low control inherent in these roles. Organisational change is common in police forces and is often directed by government or regional policy makers. However, improvements might be made by raising the level of consultation and improving communication with personnel. The level of

mental health difficulties in this sample was also high and most likely related to stress. The causal relationship between stress and mental health cannot be determined by this data, however, as with stress, mental health interventions at the organisational level are more effective than those at the individual level (Tuckey et al. 2012).

Limitations

The study has a number of limitations. Firstly, it is a cross-sectional and self-report study therefore we cannot draw conclusions about cause and effect. However, the HSE tool is the UK industry standard for organisational stress surveys and was necessary for us to compare our data to UK benchmarks. Due to the sedentary nature of the work, it might be that police contact centres contain more personnel who are unfit for operational duty because of ill-health than other police departments (see Summerfield 2011). As such, we are unaware of the grounds for re-assignment from operational duties and are unable to ascertain whether these individuals ascribe the work stress to physical, psychological or behavioural difficulties which may pre-date assignment to police contact centres. Future studies might adopt longitudinal designs to better ascertain the chronological sequence and establish whether organisational stressors lead to poor physical, psychological and behavioural outcomes or whether the relationship is bi-directional.

Secondly, much of the data pertaining to respondents' age and in particular their role is missing. This might be because the questionnaires were administered via the police force's internal systems, with the result that many respondents avoided answers which might have made them more identifiable. This meant that we were unable to make comparisons between police officers and civilian staff. However, this problem is less concerning given that roles and supervision responsibilities were not delineated between police and civilian staff and nearly all functions within the department were performed by both officers and civilian staff.

Nonetheless, in future research it would be useful to test differences in sources of work stress between civilian staff and officers.

Thirdly, the data is sourced from one police force only and therefore caution must be exercised when generalising to other forces and to other countries. Future research could extend this work by recruiting call handlers and dispatchers on a national or international basis. Fourthly, recent research on non-operational police work suggests that men are more prone to organisational stressors than women (Acquadro Maran et al. 2015), as our sample was 60% female this might have biased our results. However, the gender imbalance is not substantial and our analyses are not suggestive of strong gender differences.

Finally, although the 67% of our sample who identified their ethnicity as 'white' is lower than the UK-wide figures for the police (93%; Home office 2020), this is likely due to the large proportion (28%) who neglected to identify their ethnicity. The 5% which did identify as an ethnic minority, is more commensurate with the proportion of ethnic minorities (6.9%) in the UK police (Home office 2020).

Conclusion

This research provides evidence that police contact and dispatchers are prone to high levels of stress due to organisational factors, as well as significant physical and mental health difficulties. Although most respondents did not report very high levels of substance use, use of substances were significantly higher in those with higher stress as were mental health difficulties and physical symptoms. To reduce stress and improve outcomes in police contact and dispatch departments, police managers should routinely monitor occupational stress and where applicable, stress management plans should form part of the mitigation framework. Organisational level interventions should be cascaded throughout the service to ameroliate

work stress in the entirety of the workforce with specific focus on work demands, work control, manager support and transparency around organisational change.

Conflict of Interests. The authors declare that they have no conflict of interest.

Funding. This study was unfunded.

Ethical approval. All procedures involving human participants were in accordance with the ethical standards of the University of Wolverhampton's Faculty of Education, Health and Wellbeing Ethics Committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

References

Acquadro Maran D, Varetto A, Zedda M, Ieraci V (2015) Occupational stress, anxiety and coping strategies in police officers. Occup Med 65:466-73. https://doi.org/10.1093/occmed/kqv060

Adams CJ, Hough H, Proeschold-Bell RJ, Yao J, Kolkin M (2017) Clergy burnout: A comparison study with other helping professions. Pastoral Psychol 66:147-75. https://doi.org/10.1007/s11089-016-0722-4

Aitken A, Crawford L (2007) Coping with stress: Dispositional coping strategies of project managers. Int J Proj Manag 25:666-73. https://doi.org/10.1016/j.ijproman.2007.02.003

Akaike H (1987) Factor analysis and AIC. In Selected papers of Hirotugu Akaike (pp. 371-386) Springer, New York, NY.

Allen TD, Finkelstein LM (2014) Work–family conflict among members of full-time dual-earner couples: An examination of family life stage, gender, and age. J Occup Health Psychol 19:376-384. Doi: https://doi.org/10.1037/a0036941

Anson RH, Johnson B, Anson NW (1997) Magnitude and source of general and occupation-specific stress among police and correctional officers. J Offend Rehabil 25:103-13. https://doi.org/10.1300/J076v25n01_07

Arminger G, Stein P, Wittenberg J (1999) Mixtures of conditional mean-and covariance-structure models. Psychometrika 64:475-94. https://doi.org/10.1007/BF02294568

Artman H, Wærn Y (1999) Distributed cognition in an emergency co-ordination center. Cogn Technol Work 1:237-46. https://doi.org/10.1007/s101110050020

Asparouhov T, Muthén B (2014) Auxiliary variables in mixture modeling: Three-step approaches using M plus. Struct Equ Modeling 21:329-41. https://doi.org/10.1080/10705511.2014.915181

Atkinson C (2017) Patriarchy, gender, infantilisation: A cultural account of police intelligence work in Scotland. Aust NZ J Criminol 50:234-51. Doi: https://doi.org/10.1177/0004865815626964

Brotheridge CM, Lee RT (2003) Development and validation of the emotional labour scale. J Occup Organ Psych 76:365-79. https://doi.org/10.1348/096317903769647229

Brown J, Cooper C, Kirkcaldy B (1996) Occupational stress among senior police officers. Brit J Psychol 87:31-41. Doi: https://doi.org/10.1111/j.2044-8295.1996.tb02575.x

Campbell I, Kodz J (2011) What makes great police leadership? What research can tell us about the effectiveness of different leadership styles, competencies and behaviours. A Rapid Evidence Review. National Policing Improvement Agency, London.

Carlson DS, Kacmar KM, Williams LJ (2000) Construction and initial validation of a multidimensional measure of work–family conflict. J Vocat Behav 56:249-76. doi:10.1006/jvbe.1999.1713

Carver CS (1997) You want to measure coping but your protocols 'too long: Consider the brief cope. Int J Behav Med 4:92. https://doi.org/10.1207/s15327558ijbm0401_6

Chapin M, Brannen SJ, Singer MI, Walker M (2008) Training police leadership to recognize and address operational stress. Police Q 11:338-52. https://doi.org/10.1177/1098611107307736

Chopko BA, Palmieri PA, Adams RE (2013) Associations between police stress and alcohol use: Implications for practice. J Loss Trauma 18:482-97. https://doi.org/10.1080/15325024.2012.719340

Chopko BA, Palmieri PA, Adams RE (2015) Critical incident history questionnaire replication: Frequency and severity of trauma exposure among officers from small and midsize police agencies. J Trauma Stress 28:157-61. https://doi.org/10.1002/jts.21996

Collins PA, Gibbs AC (2003) Stress in police officers: a study of the origins, prevalence and severity of stress-related symptoms within a county police force. Occup Med 53:256-64. https://doi.org/10.1093/occmed/kqg061

Cox T, Griffiths A (2010) Work related stress: A theoretical perspective. In Leka S and Houdmont J (eds) Occupational health psychology. Wiley-Blackwell, Chichester, UK.

Dick G, Metcalfe B (2001) Managerial factors and organisational commitment-A comparative study of police officers and civilian staff. Int J Public Sect Manag 14:111-128. https://doi.org/10.1108/09513550110387336

Dollard MF, Winwood P, Tuckey MR (2019) Psychosocial Safety Climate, Psychological Health, Cynicism, and Professional Efficacy in Policing. In Dollard M, Dormann C, Idris M (eds) Psychosocial Safety Climate: A new work stress theory (pp. 169-198) Springer, Cham, London.

Edwards JA, Webster S, Van Laar D, Easton S (2008) Psychometric analysis of the UK Health and Safety Executive's Management Standards work-related stress Indicator Tool. Work Stress 22:96-107. https://doi.org/10.1080/02678370802166599

Fekedulegn D, Burchfiel CM, Hartley TA, Andrew ME, Charles LE, Tinney-Zara CA, Violanti JM (2013) Shiftwork and sickness absence among police officers: the BCOPS study. Chronobiol Int 30:930-41. https://doi.org/10.3109/07420528.2013.790043

Frone MR (2000) Work–family conflict and employee psychiatric disorders: The national comorbidity survey. Journal of Appl Psychol 85:888. https://doi.org/10.1037/0021-9010.85.6.888

Gerber M, Hartmann T, Brand S, Holsboer-Trachsler E, Pühse U (2010) The relationship between shift work, perceived stress, sleep and health in Swiss police officers. J Crim Just 38:1167-75. https://doi.org/10.1016/j.jcrimjus.2010.09.005

Gershon RR, Barocas B, Canton AN, Li X, Vlahov D (2009) Mental, physical, and behavioral outcomes associated with perceived work stress in police officers. Crim Justice Behav 36:275-89. https://doi.org/10.1177/0093854808330015

Habersaat SA, Geiger AM, Abdellaoui S, Wolf JM (2015) Health in police officers: Role of risk factor clusters and police divisions. Soc Sci Med 143:213-22. https://doi.org/10.1016/j.socscimed.2015.08.043

Hankins M (2008) The reliability of the twelve-item general health questionnaire (GHQ-12) under realistic assumptions. BMC Public Health 8:355. https://doi.org/10.1186/1471-2458-8-355

Häusser JA, Mojzisch A, Niesel M, Schulz-Hardt S (2010) Ten years on: A review of recent research on the Job Demand–Control (-Support) model and psychological well-being. Work Stress 24:1-35. https://doi.org/10.1080/02678371003683747

Heron JE, Croudace TJ, Barker ED, Tilling K (2015) A comparison of approaches for assessing covariate effects in latent class analysis. Longitud Life Course Stud 6:420-34.

Holt TJ, Blevins KR (2011) Examining job stress and satisfaction among digital forensic examiners. J Contemp Crim Just 27:230-50. http://dx.doi.org/10.14301/llcs.v6i4.322

Home Office (2020) Police Workforce, England and Wales, 31 March 2019 second edition. Home Office. https://www.gov.uk/government/statistics/police-workforce-england-and-wales-31-march-2019. Accessed 28 February 2020.

Houdmont J, Kerr R, Randall R (2012) Organisational psychosocial hazard exposures in UK policing: Management Standards Indicator Tool reference values. Policing 35:182-97. https://doi.org/10.1108/13639511211215522

Kales SN, Tsismenakis AJ, Zhang C, Soteriades ES (2009) Blood pressure in firefighters, police officers, and other emergency responders. Am J Hypertens 22:11-20. https://doi.org/10.1038/ajh.2008.296

Kelloway EK, Gottlieb BH, Barham L (1999) The source, nature, and direction of work and family conflict: A longitudinal investigation. J Occup Health Psych 4:337. https://doi.org/10.1037/1076-8998.4.4.337

Kerr R, McHugh M, McCrory M (2009) HSE Management Standards and stress-related work outcomes. Occup Med 59:574-9. https://doi.org/10.1093/occmed/kqp146

Kula S (2017) Occupational stress, supervisor support, job satisfaction, and work-related burnout: Perceptions of Turkish National Police (TNP) members. Police Pract Res 18:146-59. https://doi.org/10.1080/15614263.2016.1250630

Lanza ST, Tan X, Bray BC (2013) Latent class analysis with distal outcomes: A flexible model-based approach. Struct Equ Modeling 20:1-26. https://doi.org/10.1080/10705511.2013.742377

Lo Y, Mendell NR, Rubin DB (2001) Testing the number of components in a normal mixture. Biometrika 88:767-78. https://doi.org/10.1093/biomet/88.3.767

Lumsden K, Black A (2018) Austerity policing, emotional labour and the boundaries of police work: an ethnography of a police force control room in England. Brit J Criminol 58:606-23. https://doi.org/10.1093/bjc/azx045

Ma CC, Andrew ME, Fekedulegn D, Gu JK, Hartley TA, Charles LE, Violanti JM, Burchfiel CM (2015) Shift work and occupational stress in police officers. Saf Health Work 6:25-9. https://doi.org/10.1016/j.shaw.2014.10.001

Magnavita N, Capitanelli I, Garbarino S, Pira E (2018) Work-related stress as a cardiovascular risk factor in police officers: a systematic review of evidence. Int Arch Occ Env Hea. 91:377-89. https://doi.org/10.1007/s00420-018-1290-y

Maguen S, Metzler TJ, McCaslin SE, Inslicht SS, Henn-Haase C, Neylan TC, Marmar CR (2009) Routine work environment stress and PTSD symptoms in police officers. J Nerv Ment Dis 197:754. 10.1097/NMD.0b013e3181b975f8

McCanlies EC, Mnatsakanova A, Andrew ME, Violanti JM, Hartley TA (2019) Child care stress and anxiety in police officers moderated by work factors. Policing 42:992-1006. https://doi.org/10.1108/PIJPSM-10-2018-0159

McLachlan G, Peel D (2004) Finite mixture models. John Wiley & Sons, New Jersey, USA.

Montano D, Hoven H, Siegrist J (2014) Effects of organisational-level interventions at work on employees' health: a systematic review. BMC public health 14:135. https://doi.org/10.1186/1471-2458-14-135

Morash M, Haarr R, Kwak DH (2006) Multilevel influences on police stress. J Contemp Crim Just 22:26-43. https://doi.org/10.1177/1043986205285055

Muthén LK, Muthén BO (2017) MPlus: statistical analysis with latent variables--User's guide. Muthén and Muthén, Los Angeles, USA.

Patterson BL (1992) Job experience and perceived job stress among police, correctional, and probation/parole officers. Crim Just Behav 19:260-85. https://doi.org/10.1177/0093854892019003004

Pearson-Goff M, Herrington V (2014) Police leadership: A systematic review of the literature. Policing 8:14-26. https://doi.org/10.1093/police/pat027

Perrott SB, Taylor DM (1995) Attitudinal differences between police constables and their supervisors: potential influences of personality, work environment, and occupational role. Crim Just Behav 22:326-39. https://doi.org/10.1177/0093854895022003009

Petrie K, Gayed A, Bryan BT, Deady M, Madan I, Savic A, Wooldridge Z, Counson I, Calvo RA, Glozier N, Harvey SB (2018) The importance of manager support for the mental health and well-being of ambulance personnel. PloS One 13:e0197802. Doi: https://doi.org/10.1371/journal. pone.0197802

Planche K, Chan JF, Di Nota PM, Beston B, Boychuk E, Collins PI, Andersen JP (2019) Diurnal cortisol variation according to high-risk occupational specialty within police: comparisons between frontline, tactical officers, and the general population. J Occup Environ Med 61:e260-5. doi: 10.1097/JOM.0000000000001591

Rasdi I, Ismail NF, Kong AS, Saliluddin SM (2018) Introduction to customized occupational safety and health website and its effectiveness in improving psychosocial safety climate (PSC) among police officers. Malaysian J. Med. Health Sci 14:67-73. Doi: https://core.ac.uk/download/pdf/159130401.pdf

Regehr C, LeBlanc VR (2017) PTSD, acute stress, performance and decision-making in emergency service workers. J Am Acad Psychiatry Law 45:184-92. https://europepmc.org/article/med/28619858

Rose T, Unnithan P (2015) In or out of the group? Police sub-culture and occupational stress. *Policing: An International Journal of Police Strategies & Management*. 38: 279-294. https://doi.org/10.1108/PIJPSM-10-2014-0111

Schwarz G (1978) Estimating the dimension of a model. Ann Stat 6:461-4. doi:10.1214/aos/1176344136

Sclove SL (1987) Application of model-selection criteria to some problems in multivariate analysis. Psychometrika 52:333-43. https://doi.org/10.1007/BF02294360

Schafer JL, Graham, JW (2002) Missing data: our view of the state of the art. Psychol methods, 7:147. https://doi.org/10.1037/1082-989X.7.2.147

Shane JM (2010) Organizational stressors and police performance. J Criminal Just 38:807-18. https://doi.org/10.1016/j.jcrimjus.2010.05.008

Shane JM (2020) Stress inside police departments: How the organization creates stress and performance problems in police departments. Routledge, London.

Shuler S (2001) Talking community at 911: The centrality of communication in coping with emotional labor. In Shepherd G, Rothenbuhler E (eds) Communication and community. Lawrence Erlbaum, New Jersey, USA.

Silvestri M (2007) "Doing" police leadership: enter the "new smart macho." Policing Soc 17:38-58. Doi: https://doi.org/10.1080/10439460601124130

Silvestri M (2017) Police culture and gender: Revisiting the 'cult of masculinity'. Policing 11:289-300. Doi: https://doi.org/10.1093/police/paw052

Spector PE, Jex SM (1998) Development of four self-report measures of job stressors and strain: interpersonal conflict at work scale, organizational constraints scale, quantitative workload inventory, and physical symptoms inventory. J Occup Health Psych 3:356. https://doi.org/10.1037/1076-8998.3.4.356

Steinkopf B, Reddin RA, Black RA, Van Hasselt VB, Couwels J (2018) Assessment of stress and resiliency in emergency dispatchers. J Police Criminal Psych 33:398-411. https://doi.org/10.1007/s11896-018-9255-3

Summerfield D (2011) Metropolitan Police blues: protracted sickness absence, ill health retirement, and the occupational psychiatrist. Bmj 342:d2127. https://doi.org/10.1136/bmj.d2127

Trounson JS, Pfeifer JE, Critchley C (2016) Correctional officers and work-related environmental adversity: A cross-occupational comparison. Appl Psychol Crim Just 12:18-35.

Tuckey MR, Winwood PC, Dollard MF (2012) Psychosocial culture and pathways to psychological injury within policing. Police Pract Res 13:224-40. https://doi.org/10.1080/15614263.2011.574072

Van der Doef M, Maes S (1999) The job demand-control (-support) model and psychological well-being: a review of 20 years of empirical research. Work Stress 13:87-114. https://doi.org/10.1080/026783799296084

Violanti JM, Aron F (1995) Police stressors: Variations in perception among police personnel. Journal of Criminal Justice 23:287-94. https://doi.org/10.1016/0047-2352(95)00012-F

Violanti JM, Charles LE, McCanlies E, Hartley TA, Baughman P, Andrew ME, Fekedulegn D, Ma CC, Mnatsakanova A, Burchfiel CM (2017) Police stressors and health: A state-of-the-art review. Policing 40:642-56. https://doi.org/10.1108/PIJPSM-06-2016-0097

Violanti JM, Fekedulegn D, Hartley TA, Charles LE, Andrew ME, Ma CC, Burchfiel CM (2016) Highly rated and most frequent stressors among police officers: gender differences. American journal of criminal justice 41:645-62. https://doi.org/10.1007/s12103-016-9342-x

Walvekar SS, Ambekar JG, Devaranavadagi BB (2015) Study on serum cortisol and perceived stress scale in the police constables. J Clin Diagn Res 9:BC10. 10.7860/JCDR/2015/12015.5576

Yuan KH, Bentler PM (2000) Three likelihood-based methods for mean and covariance structure analysis with nonnormal missing data. Sociol Methodol 30:165-200. https://doi.org/10.1111/0081-1750.00078

Yuan C, Wang Z, Inslicht SS, McCaslin SE, Metzler TJ, Henn-Haase C, Apfel BA, Tong H, Neylan TC, Fang Y, Marmar CR (2011) Protective factors for posttraumatic stress disorder symptoms in a prospective study of police officers. Psychiat Res 188:45-50. https://doi.org/10.1016/j.psychres.2010.10.034

Tables

Table 1. Descriptive statistics for all variables of interest.

Items	Norm	*M*	SD	Min Max	Skew
Demands	3.05[a]	**2.96**	0.66	8 - 40	0.23 *
Control	3.42 [a]	**2.50**	0.87	6 - 30	0.36 **
Managerial support	3.47 [a]	**3.06**	0.91	5 - 25	-0.04 **
Peer support	3.80 [a]	*3.70*	0.75	4 - 20	-0.45 **
Relationships	3.77 [a]	*3.66*	0.72	4 - 20	0.67 **
Role	4.18 [a]	*4.16*	0.63	5 - 25	-0.78 **
Change	3.00 [a]	**2.67**	0.81	3 -15	0.25 **
Physical symptoms inventory	/	12.39	7.40	0 - 48	0.77 **
Substance use	2.24 [b]	2.73	1.30	2 - 8	2.12 **
GHQ 12	10.6 [c]	19.82	5.80	0 - 36	0.10 **
FIW	1.96[d]	2.09	0.96	3-15	0.55 **

Note: * = *P* < .05; ** *P* < .01. Norm data taken from: a = Edwards, Webster, Van Laar and Easton (2008); b = Aitken and Crawford (2007); c = Hankins (2007); d = Frone (2000). Red flag means in bold, yellow flagged means in italics.

Table 2. Fit Indices for Latent Class Models One to Six.

	Loglikelihood	AIC	BIC	SaBIC	LMRT	BLRT	Entropy
1 class	-10181.89	20391.78	20452.10	20407.65	--	--	--
2 class	-9853.42	19750.84	19845.62	19775.78	644.17 **	656.94 **	0.75
3 class	**-9737.45**	**19534.90**	**19664.14**	**19568.91**	**227.44 ***	**231.94 ****	**0.82**
4 class	-9682.13	19440.27	19603.98	19483.35	108.47	110.62 **	0.78
5 class	-9649.33	19390.66	19588.83	19442.81	64.341	65.61 **	0.79
6 class	-9625.41	19358.82	19591.46	19420.04	46.90	47.83 **	0.75

AIC=Akaike information criterion, BIC=Bayesian Information Criterion, SSABIC=Sample Size Adjusted BIC, LRT=Lo-Mendell–Rubin adjusted LRT value and associated significance level. BLRT= Bootstrapped Lo-Mendell Rubin Test.
*=*P*<0.05, ** = *P* <0.001

Table 3. Shows the Socio-demographic Predictors of Class membership.

Classes	Age	Ethic Group	Sex	FIW
		ß (S.E) P value		
Class 2 High stress	-0.00 (0.01)	0.00 (0.05)	0.22 (0.23)	**0.08 (0.04) ***
Class 3 Very high stress	0.01 (0.03)	0.06 (1.20)	1.06 (0.62)	**0.22 (0.11) ***

*=*P*<0.05 Class 1 = Reference class omitted from table.

Table 4. Shows Class Membership on Distal Outcomes.

Outcomes	C3: Very high occupational stress	C2: High occupational stress	C1: Low occupational stress	Pairwise comparisons
	Mean (SE)	Mean (SE)	Mean (SE)	C1vsC2vsC3
Physical symptoms inventory	23.18 (2.0)	14.06 (0.44)	9.81 (0.45)	C1 vs C2= 0.000** C1 vs C3= 0.000** C2 vs C3= 0.000**
Substance use	5.55 (1.2)	4.19 (0.29)	3.13 (0.20)	C1 vs C2= 0.272* C1 vs C3= 0.047 C2 vs C3= 0.004*
GHQ12	28.28 (1.2)	23.33 (0.55)	17.87 (0.45)	C1 vs C2= 0.000** C1 vs C3= 0.000** C2 vs C3= 0.000**

*=*P*<0.05, ** = *P* <0.001

Fig 1. Profile plot of HSE Management Standards Indicator Tool.